

# Bringing Action to Exergames for Children with Cerebral Palsy

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## Children with Cerebral Palsy want to play action games

This is particularly true of exergames, whose physically-active gameplay matches the fast pace of action games.

But limitations in **gross motor function**, **manual ability**, **hand-eye coordination** and **visual spatial processing** associated with Cerebral Palsy (CP) make it difficult to play action games.



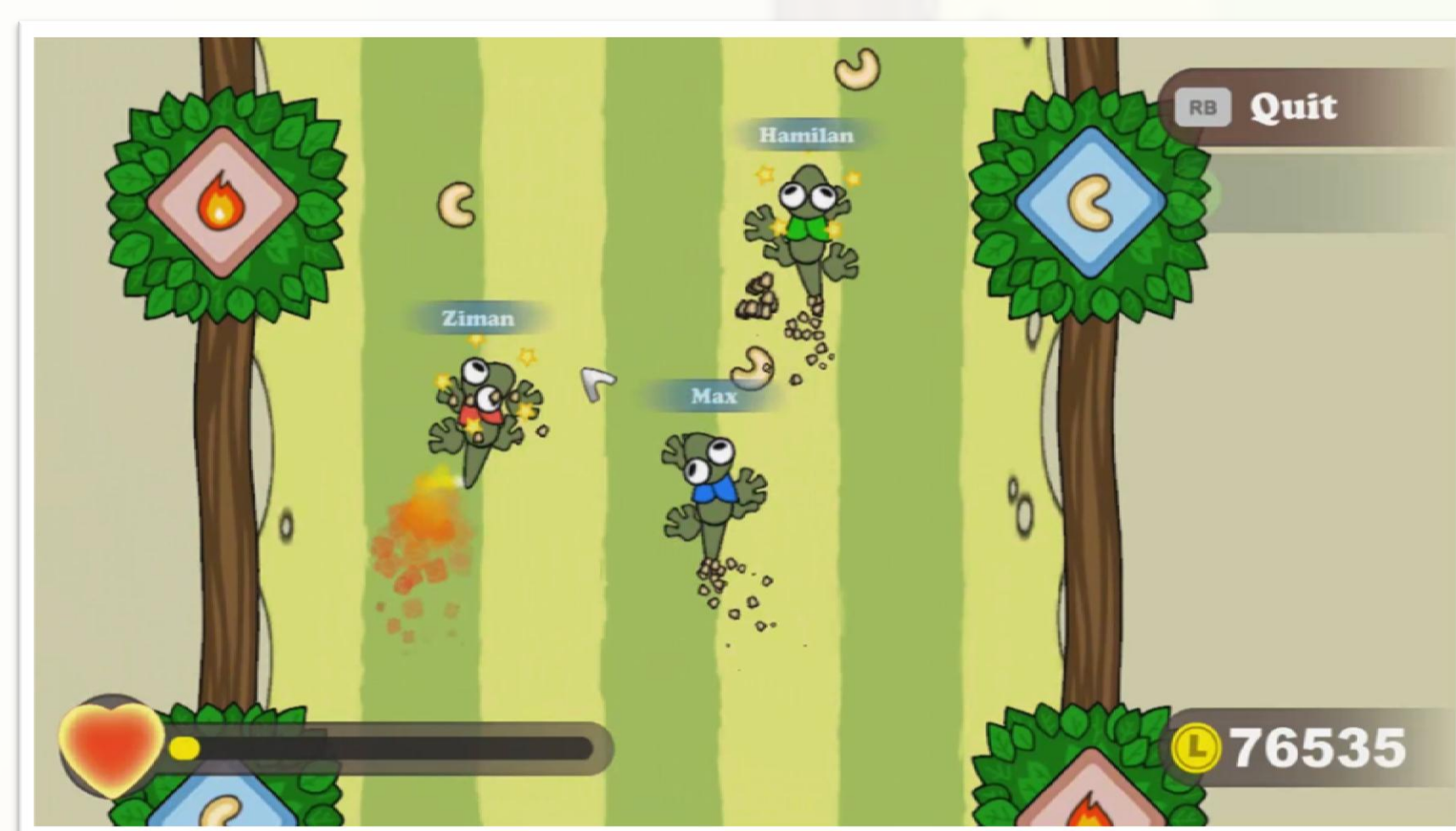
## Traditional design guidelines are useful but tend to produce slow paced games

It is no accident that most exergames designed for people with motor disabilities are slow-paced. Examples of traditional guidelines say:

- “ensure that gameplay is not reliant on precise timing or movements” and
- “avoid multiple simultaneous actions”

## We followed a different approach and focused on what children with CP can do

From a year long participatory design process with children with CP, we found approaches that help to design action games that children with CP can play and enjoy. For example:



### Gameplay can involve high-speed navigation of a level

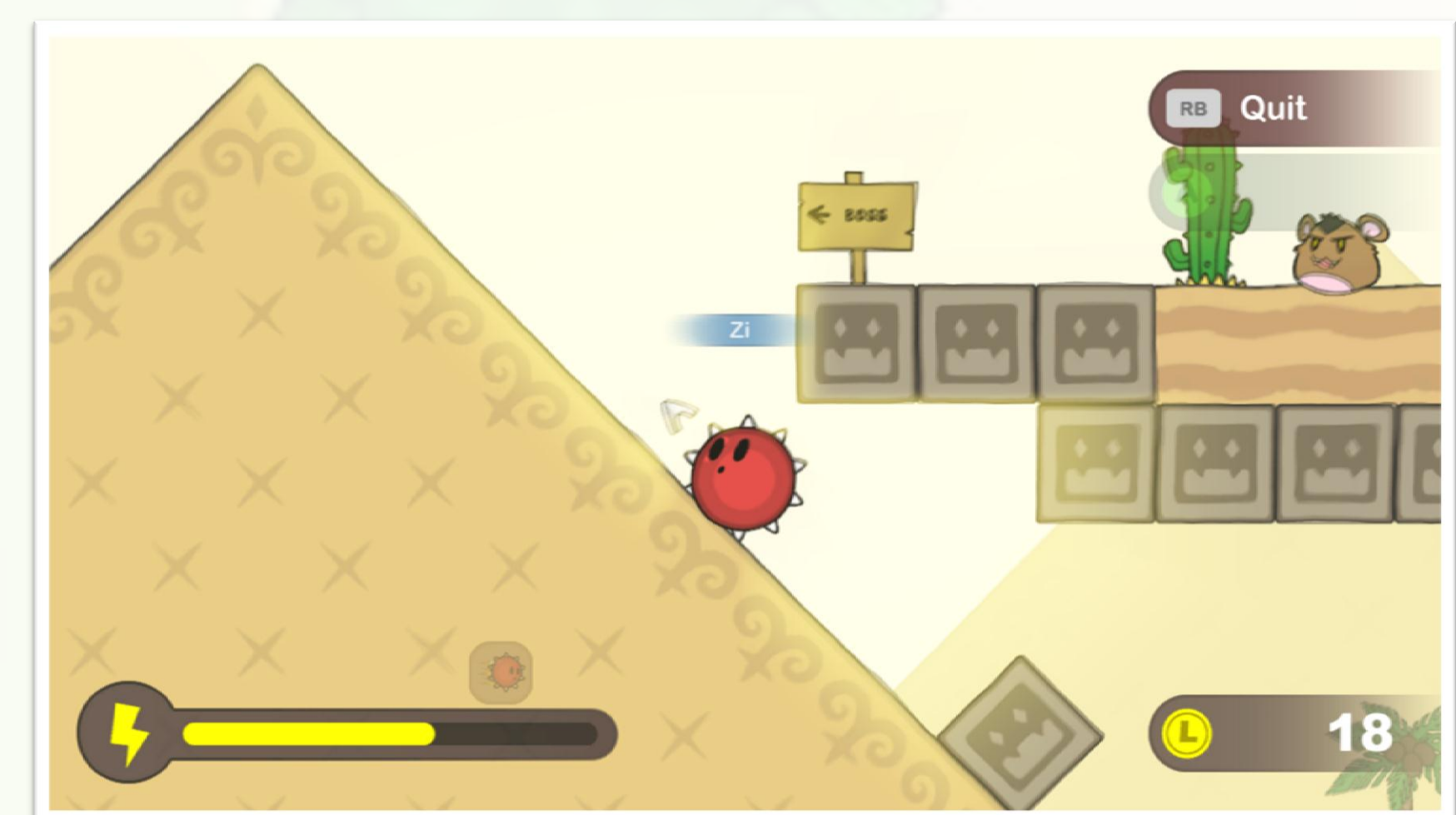
(e.g., a racetrack.) But the level should:

- be designed to have linear progression
- avoid obstacles
- not permit collisions between players
- not require accurate aiming.

### Gameplay can be time-sensitive (such as in platformer games.)

But:

- the geometry of the game should permit pausing and retrying,
- the control scheme should be simple,
- the penalty for errors should be low.



## With Liberi, we brought action to exergames for children with CP

Through this year long process, we developed Liberi, an action-oriented exergame that shows how to bring action to exergames for children with CP at level III on the Gross Motor Function Classification Scale.

A follow-up eight-week home trial found Liberi to be playable and enjoyable and showed improvement in physical fitness (measured by the shuttle run test) and quality of life (measured by the Kidscreen questionnaire).

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